

CLAIMS

WE CLAIM:

1. An orthopaedic support for comfortably supporting the ankle of a wearer, comprising:
an outer shell formed for fitting about the lower leg of the wearer;
a molded pad bonded to said shell;
5 said pad having a surface; and
said pad having a plurality of molded substantially hollow structures to provide differing levels of cushioning support for the wearer of the orthopaedic support at different areas of the pad, at least some of said structures having a different dimension than others of said structures;
10 wherein said molded structures comprise walls, said walls providing cushioning support for the ankle even without inflating or otherwise filling said molded structures with air, liquid, gel and the like.
2. An orthopaedic support in accordance with 1 wherein an overmold substantially surrounds said pad and said shell substantially sealing together said orthopaedic support.
3. An orthopaedic support as defined in claim 1 further comprising an overmold molded onto said shell, said pad being bonded to said overmold.
4. An orthopaedic support as defined in claim 1 further comprising means for securing said ankle support around the lower leg; and a heel strap for securing said orthopaedic support.
5. An orthopaedic support as defined in claim 1 wherein said pad bonded to said shell forms a fluid-filled bladder.
6. An orthopaedic support as defined in claim 1 wherein an inner liner of cloth is secured to said pad on the surface of said pad facing the lower leg of the user.

7. An orthopaedic support as defined in claim 6 wherein said liner is integrated with said pad.
8. An orthopaedic support in accordance with claim 7 wherein said liner includes openings allowing air to pass in and out of said structures.
9. An orthopaedic support as defined in claim 1, wherein said pad further comprises a plurality of fingers extending from said pad to said outer shell.
10. An orthopaedic support as defined in claim 9, wherein said fingers are integrally molded with said pad.
11. An orthopaedic support as defined in claim 9, wherein some of said fingers have a different length than others of said fingers.
12. An orthopaedic support as defined in claim 11, wherein said support has a malleolar region that is adapted to be placed against a malleolus of an ankle, said malleolar region having fingers of a greater length than fingers in other regions of said support.
13. An orthopaedic support for comfortably supporting a select area of the anatomy, said support comprising:
a substantially rigid shell; and
an injection molded resilient pad between said shell and the anatomy of the user, said pad configured with geometric shaped cells providing cushioning and support;
wherein said cells comprise walls, the structure of said walls providing cushioning support for the select area of the anatomy even without inflating the cells with air or otherwise filling said cells with liquid, gel and the like.
14. An orthopaedic support as defined in claim 13 further comprising an overmold molded onto said shell, said pad being connected to said overmold.
15. An orthopaedic support as defined in claim 13 wherein said pad is a bladder having a plurality of cells having cushioning geometric shapes and protrusions, each

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cell with predetermined size, depth, and wall thickness providing varying levels of localized support and cushion in different areas of said support.

16. An orthopaedic support as defined in claim 15 wherein said geometric shapes for said bladder are selected from the group consisting of ribs, cylinders, honeycomb, and regular and irregular polygons.

17. An orthopaedic support as defined in claim 15 wherein channels are provided between said cells for allowing a fluid to pass between and among said cells, creating a massaging effect on the ankle and promoting blood flow.

18. An orthopaedic support as defined in claim 17 wherein channels are provided through an outer wall of said pad to at least one of said cells to allow water to pass between and among said cells for hot and cold therapies.

19. An orthopaedic support as defined in claim 17 wherein said support further comprises inlet and outlet valves for allowing entry and removal of air and liquids.

20. An orthopaedic support as defined in claim 13 wherein said pad further comprises a foam core for softer inner cushion.

21. An orthopaedic support as defined in claim 13 wherein a co-molded lip around said shell and around said pad seals said pad such that air is trapped between said pad and said shell, creating a bladder with air cushion.

22. An orthopaedic support as defined in claim 13 wherein said pad is molded directly onto said shell as channels, domes, and other supportive geometrical shapes to cushion and to support the anatomy.

23. An orthopaedic support as defined in claim 13 wherein said pad includes a plurality of fingers extending from said pad to said shell.

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24. An orthopaedic support comprising:
a substantially rigid shell formed to fit a limb of a user;
an injection molded pad for cushioning the shell to the limb;
said injection molded pad being integrally molded in a single molding step.
25. An orthopaedic support as defined in claim 24 wherein said pad includes interconnected cells, and further comprising a heel bladder fluidically coupled to said pad for varying the pressure exerted by said pad on the limb of the user.
26. An orthopaedic support pad as defined in claim 24 wherein said pad is a bladder having geometrically shaped cells to provide differing levels of localized cushioning and a plurality of channels molded between said cells to allow air and fluid to pass between said cells.
27. An orthopaedic support pad as defined in claim 26 further comprising fluid inlets and outlets to allow entry and removal of fluid from said pad for hot and cold therapy.
28. An orthopaedic support as defined in claim 26 wherein at least one cell defines a closed space forming an internal bladder.
29. An orthopaedic support as defined in claim 24 wherein said shell further comprises a shell frame and a shell core which is removably mounted within said shell.
30. An orthopaedic support as defined in claim 24 wherein a breathable liner covers said pad.
31. An orthopaedic support as defined in claim 24 wherein said pad includes a plurality of integrally-molded fingers extending from said pad to said shell.
32. An orthopaedic support as defined in claim 24 further comprising an overmold molded onto said shell.

33. An orthopaedic support for comfortably supporting the ankle comprising:
an ankle support formed for fitting about the lower leg, having appropriate
configuration to support the ankle;

5 said ankle support comprising a substantially rigid outer shell and a molded
pad for cushioning;

said pad having an inner surface and an outer layer, said inner surface
including resilient material having cells therein for providing resilient support to the
ankle; and

10 said pad being bonded to said outer shell;
wherein said outer shell has at least one opening to allow air to escape from
space in between said outer shell and said pad, said cells providing resilient support to
the ankle from the structure of the cells even without being filled with air, liquid, gel
and the like.

34. An orthopaedic support as defined in claim 33 wherein at least some of said air
spaces are filled with foam for cushioning.

35. An orthopaedic support as defined in claim 34 wherein said foam surrounds
but not covers the malleolus.

36. An orthopaedic support as defined in claim 33 wherein said pad includes a
plurality of fingers extending from said pad toward said shell.

37. An orthopaedic support as defined in claim 33 further comprising an overmold
molded onto said shell.

38. An orthopaedic support as defined in claim 37 wherein said pad is bonded to
said overmold.

39. An orthopaedic support as defined in claim 38 wherein said overmold includes
a ridge extending about the periphery of the overmold, said pad having an outer edge
that engages with said ridge.

40. An orthopaedic support as defined in claim 33 wherein said pad includes a plurality of air holes to prevent formation of a bladder between said pad and said shell.

41. An orthopaedic support as defined in claim 33 wherein said pad has a non-uniform skin thickness, said pad having at least one region having skin that is thicker than at least one other region, in order to improve the function of the support.

42. An orthopaedic support comprising:

a flexible, molded outer shell having a first surface and a second surface, said first surface having an indentation therein; and at least one insert comprising a material that is relatively stiffer than said outer shell;

said support having a first mode in which said insert is removably secured within said indentation in said outer shell to stiffen the support, and a second mode in which said insert is removed from said indentation in said outer shell to make said support more flexible relative to said first mode.

43. An orthopaedic support as defined in claim 42, wherein said insert and said outer shell are adapted such that said insert is securable into the indentation in said outer shell by snap fit.

44. An orthopaedic support as defined in claim 42 further comprising a molded pad bonded to said shell, said pad having a substantially continuous surface and having a plurality of molded structures to provide differing levels of cushioning support for the wearer of the orthopaedic support at different areas of the pad, said substantially continuous surface of said pad being adapted to be placed against a portion of the anatomy to be supported.

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45. An orthopaedic support comprising:
a flexible, molded outer shell; and
at least one auxiliary member comprising a material that is relatively stiffer than said outer shell;

said support having a first mode in which said auxiliary member is removably secured to said outer shell to stiffen the support, and a second mode in which said insert is removed from said support to make said support more flexible relative to said first mode.

46. An orthopaedic support as defined in claim 45 further comprising a plurality of different interchangeable auxiliary members, each having a different stiffness, wherein a user may select a particular member depending on the stiffness desired.

47. An orthopaedic support for comfortably supporting the ankle of a wearer, comprising:

an outer shell formed for fitting about the lower leg of the wearer;
a molded pad bonded to said shell;
said pad having a plurality of molded structures in between said pad and said shell to provide cushioning support for the wearer;

wherein said molded structures comprise walls, the structure of said walls providing cushioning support for the select area of the anatomy without inflating said structures with air or otherwise filling said structures with liquid, gel and the like.

48. An orthopaedic support for comfortably supporting a select area of the anatomy, said support comprising:

a substantially rigid shell; and
an injection molded resilient pad between said shell and the anatomy of the user, said pad being configured with geometric shaped cells providing cushioning and support;
said pad being bonded to said shell to form a fluid-filled bladder.

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49. An orthopaedic support as defined in claim 48, further comprising a molded pad bonded to said shell, said pad having a substantially continuous surface and having a plurality of molded structures to provide differing levels of cushioning support for the wearer of the orthopaedic support at different areas of the pad, said substantially continuous surface of said pad being adapted to be placed against a portion of the anatomy to be supported.

50. An orthopaedic support for comfortably supporting the ankle of a wearer, comprising:

an outer shell formed for fitting about the lower leg of the wearer;

a molded pad bonded to said shell;

said pad having a surface; and

said pad having a plurality of molded structures to provide differing levels of cushioning support for the wearer of the orthopaedic support at different areas of the pad, at least some of said structures having a different dimension than others of said structures;

wherein said pad further comprises a plurality of fingers extending from said pad to said outer shell;

some of said fingers having a different length than others of said fingers; and

said support having a malleolar region that is adapted to be placed against a malleolus of an ankle, said malleolar region having fingers of a greater length than fingers in other regions of said support.

51. An orthopaedic support for comfortably supporting a select area of the anatomy, said support comprising:

a substantially rigid shell; and

an injection molded resilient pad between said shell and the anatomy of the user, said pad configured with geometric shaped cells providing cushioning and support;

wherein said pad is a bladder having a plurality of cells having cushioning geometric shapes and protrusions, each cell with predetermined size, depth, and wall thickness providing varying levels of localized support and cushion in different areas of said support;

wherein channels are provided between said cells for allowing a fluid to pass between and among said cells, creating a massaging effect on the ankle and promoting blood flow; and

wherein channels are provided through an outer wall of said pad to at least one of said cells for allowing a fluid to flow into said pad for hot and cold therapies.

52. An orthopaedic support comprising:
a substantially rigid shell formed to fit a limb of a user;
an injection molded pad for cushioning the shell to the limb;
said injection molded pad being integrally molded in a single molding step;
wherein said pad is a bladder having geometrically shaped cells to provide differing levels of localized cushioning and a plurality of channels molded between said cells to allow air and fluid to pass between said cells;
wherein at least one cell defines a closed space forming an internal bladder.

53. An orthopaedic support comprising:
a substantially rigid shell formed to fit a limb of a user;
an injection molded pad for cushioning the shell to the limb;
said injection molded pad being integrally molded in a single molding step;
wherein said shell further comprises a shell frame and a shell core which is removably mounted within said shell.

54. An orthopaedic support for comfortably supporting the ankle comprising:
an ankle support formed for fitting about the lower leg, having appropriate configuration to support the ankle;
said ankle support comprising a substantially rigid outer shell and a molded pad for cushioning;
said pad having an inner surface and an outer layer, said inner surface including resilient material having cells therein for providing resilient support to the ankle; and
said pad being bonded to said outer shell;
wherein said outer shell has at least one opening to allow air to escape from space in between said outer shell and said pad, said cells providing resilient support to the ankle from the structure of the cells even without being filled with air;
wherein at least some of said air spaces are filled with foam for cushioning; and
wherein said foam surrounds but not covers the malleolus.

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55. An orthopaedic support for comfortably supporting the ankle comprising:
an ankle support formed for fitting about the lower leg, having appropriate
configuration to support the ankle;

said ankle support comprising a substantially rigid outer shell and a molded pad for
cushioning;

said pad having an inner surface and an outer layer, said inner surface including
resilient material having cells therein for providing resilient support to the ankle; and

said pad being bonded to said outer shell;

wherein said outer shell has at least one opening to allow air to escape from space in
between said outer shell and said pad, said cells providing resilient support to the ankle from
the structure of the cells even without being filled with air;

wherein said orthopaedic support further comprises an overmold molded onto said
shell;

wherein said pad is bonded to said overmold; and

wherein said overmold includes a ridge extending about the periphery of the
overmold, said pad having an outer edge that engages with said ridge.

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56. An orthopaedic support for comfortably supporting the ankle comprising:
an ankle support formed for fitting about the lower leg, having appropriate
configuration to support the ankle;

said ankle support comprising a substantially rigid outer shell and a molded pad for
cushioning;

said pad having an inner surface and an outer layer, said inner surface including
resilient material having cells therein for providing resilient support to the ankle; and

said pad being bonded to said outer shell;

wherein said outer shell has at least one opening to allow air to escape from space in
between said outer shell and said pad, said cells providing resilient support to the ankle from
the structure of the cells even without being filled with air; and

wherein said pad has a non-uniform skin thickness, said pad having at least one region
having skin that is thicker than at least one other region, in order to improve the function of
the support.

57. An orthopaedic support comprising:

a flexible, molded outer shell having a first surface and a second surface, said first
surface having an indentation therein; and at least one insert comprising a material that is
relatively stiffer than said outer shell;

said support having a first mode in which said insert is removably secured within said
indentation to stiffen the support, and a second mode in which said insert is removed from
said indentation to make said support more flexible relative to said first mode;

wherein said orthopaedic support further comprises a molded pad bonded to said
shell, said pad having a substantially continuous surface and having a plurality of molded
structures to provide differing levels of cushioning support for the wearer of the orthopaedic
support at different areas of the pad, said substantially continuous surface of said pad being
adapted to be placed against a portion of the anatomy to be supported.

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58. An orthopaedic support comprising:
a flexible, molded outer shell; and
a plurality of different interchangeable auxiliary members, at least one of said auxiliary members comprising a material that is relatively stiffer than said outer shell;
said support having a first mode in which at least one of said auxiliary member is removably secured to said outer shell to stiffen the support, and a second mode in which said at least one insert is removed from said support to make said support more flexible relative to said first mode;
wherein a user may select a particular member depending on the stiffness desired.

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